

REMARKS

Claims 1 and 10 have been amended. Claims 2, 4-5, 11, and 13-14 were previously canceled. Reexamination and reconsideration of the pending claims are respectfully requested.

Claim Rejections – 35 U.S.C. § 112

The Examiner rejected Claims 1 and 10 under 35 U.S.C. § 112, first paragraph because certain subject matter was not described in the specification. Claims 1 and 10 include “a plastic non-ferromagnetic coil form,” “an enameled copper wire,” and “a single layer around said coil form,” all of which the Examiner has indicated are not supported in the specification.

As noted above in the Interview Summary, these claim limitations were discussed with the Examiners. Applicants have removed reference to “non-ferromagnetic” and “enameled” from Claims 1 and 10. No change was made to “a single layer around said coil” claim limitation as the Examiners agreed is acceptable and supported by the specification. Accordingly, Applicants respectfully request withdrawal of this rejection.

Claim Rejections – 35 U.S.C. § 103

The Examiner rejected Claims 1, 8-10, and 17-18 under 35 U.S.C. § 103 as being unpatentable over U.S. Published Patent Application No. 2003/0102947 (“Ho”) in view of U.S. Patent No. 6,275,365 (“Kalsi”), U.S. Patent No. 5,835,066 (“Kropielnicki”), and U.S. Patent No. 5,391,831 (“Lace”).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.” M.P.E.P. § 2142 *citing In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Ho does not teach or suggest the subject matter of amended independent Claim 1. Ho does not teach or suggest a protection device comprising a plastic coil form onto which the

winding is applied, wherein the electrically conductive winding is a bifilar winding which is made from copper wire wound in a single layer around said coil form. Rather, Ho discloses a multipurpose input device connected between an AC input source and a rectifying circuit 3. Paragraph 14. The multipurpose input device comprises a magnetic component 1 and a resistance coil 2. Id. The magnetic component 1 is a magnetic core having ferromagnetic characteristics. Paragraph 15.

Ho does not teach or suggest a plastic coil form, copper wire used for the winding, and that the wire has a circular cross-section. Ho also does not teach or suggest a bifilar winding as acknowledged by the Examiner in the present Office action on page 5. For these and other reasons, Ho does not teach or suggest the subject matter defined by independent Claim 1. Kalsi does not cure the deficiencies of Ho. Kalsi does not teach or suggest a protection device wherein the electrically conductive winding is a bifilar winding which is made from copper wire wound in a single layer around said coil form and that the wire has a circular cross-section. Rather, Kalsi discloses a sub-network 104 including a superconducting fault current limiter 10 connected between the output of a transformer 108 and a connection point 114. The sub-network 104 provides electrical power to a geographical region, such as an industrial complex or a residential area via power transmission lines. The transformer 108 is used for stepping-down a high voltage, such as 110KV to a lower distribution voltage, such as 10.5KV. The superconducting fault current limiter 10 includes a series of bifilar “pancake” coils 12, each having co-wound, bifilar conductors. Each pancake coil 12 is formed from the same continuous length of superconducting tape 14 as a pair of conductive segments 32, 34 folded over itself at an intermediate loop region 36 and then wound around a support tube 18. Each pancake coil 12 includes a plurality of layers, and the superconducting tape 14 has a rectangular cross-section. See Figs. 2-3.

For these and other reasons, Kalsi does not teach or suggest the subject matter defined by independent Claim 1.

In addition, there is no suggestion or motivation to combine the teachings of Ho and Kalsi. A person of ordinary skill in the art would not look to superconductor fault current limiters used in power plant applications for meeting the EMC requirements for a power supply circuit. When considering inductance issues, one must consider, at least, the material of the core, the width of the core, the diameter of the wire, the number of turns of the wire around the core,

and the spacing between the turns of the coil. When combining electrical components of one reference with electrical components of another reference, one must consider the electrical characteristics when attempting to combine two references that teach electrical components with diverse configurations and functionalities. In the present case, the Examiner is attempting to combine a superconducting current limiter, described in Kalsi that is used in power plants that must handle 100-plus amperes, with the multipurpose input device of Ho that most likely must handle considerably less than 100-plus amperes. The structures of the devices in Ho and Kalsi are distinct and before combining these structures, the electrical characteristics must be taken into consideration.

As such, when trying to replace the multilayer coil of Ho with the plurality of bifilar pancake coils of Kalsi, one cannot ignore the electrical characteristics of this combination. First, if the combination was created as indicated by the Examiner on page 5, the bifilar pancake coils of Kalsi would be placed on a ferromagnetic core of Ho, and whether or not this combination would work would need to be determined and the effect on inductance also would need to be determined. Second, the stack of bifilar pancake coils of Kalsi is quite different than the winding configuration of Ho, so one would need to determine if the stacking structure is feasible. Again, the electrical characteristics must be considered, and if the stacking structure of Kalsi in combination with the ferromagnetic core of Ho increases the inductance, then the intended purpose of the input device of Ho has been eliminated. Third, Kalsi requires that the plurality of bifilar pancake coils be adjacent to one another and electrically connected, because the flux generated by the flow of current in the adjacent windings have the opposite sense and, cancel, thereby reducing the overall inductance of the coil. If this configuration is combined with the ferromagnetic core of Ho, then one needs to determine if the same effect would occur. As a result, it appears that considerable experimentation would be required to determine if the combination would work and whether the desired effect – reduction of inductance – in a current limiting device would be achieved.

For at least these reasons, the combination of Ho and Kalsi does not teach or suggest the subject matter of independent Claim 1.

Lace does not cure the deficiencies of Ho and Kalsi. Lace does not teach or suggest a protection device wherein the electrically conductive winding is a bifilar winding which is made from copper wire wound in a single layer around said coil form. Rather, Lace discloses an

electromagnetic pickup for a guitar. The pickup detects the vibrations of the guitar strings and generates electrical signals, which are then amplified and reproduced by speakers. The pickup includes a ferromagnetic shell and core 140 with a non-magnetic coil form 142 mounted on the core. An electrical pickup coil 143 is mounted in coil form 142. The pickup coil 143 generates an electrical signal representative of movements of the guitar strings. This configuration provides a high signal-to-noise ratio where virtually no hum is in the output signal from the pickup.

In addition, there is no suggestion or motivation to combine the teachings of Lace with Ho and Kalsi. Lace discloses an electromagnetic pickup for detecting vibration of guitar strings and generating electrical signals for reproduction by a speaker. The guitar pickup has nothing to do with limiting current to an appliance or reducing the effects of inductance. Lace is simply non-analogous art. There is no reason for a person of ordinary skill in the art to look to signal reproduction devices when designing a current limiting device.

Kropielnicki does not cure the deficiencies of Ho, Kalsi, and Lace. Kropielnicki does not teach or suggest, among other things, a plastic coil form wherein the electrically conductive winding is a bifilar winding which is wound in a single layer around said coil form. Rather, Kropielnicki discloses a signal separating device including a bifilar coil construction for isolating radio signals picked up by a motor vehicle window heating element from the power supply circuit for the heating element. The bifilar coil construction includes two windings 9, 10 supported by a pot core. The two windings 9, 10 create a doublewound coil where the first winding fits closely within the second winding with the turns of the first winding spaced radially inwardly of the turns of the second winding. As illustrated in the figures, winding 10 overlaps winding 9 to create a two layer coil. The pot core is formed of two halves 15, 16 that are formed integrally in one piece from a ferrous ceramic structure.

In addition, there is no suggestion or motivation to combine the teachings of Ho, Kalsi, Lace, and Kropielnicki. Kropielnicki discloses a signal separating device and has nothing to do with limiting current to an appliance or reducing the effects of inductance. Kropielnicki is simply non-analogous art.

For at least these reasons, the combination of Ho, Kalsi, Lace, and Kropielnicki does not teach or suggest the subject matter of independent Claim 1.

Accordingly, independent Claim 1 is allowable. Dependent Claims 3 and 6-9 depend from independent Claim 1 and are allowable for the same and other reasons.

Ho and Kalsi also do not teach or suggest the subject matter of amended independent Claim 10. For at least the same or similar reasons specified above with respect to Claim 1, Ho, Kalsi, Lace, and Kropielnicki do not teach or suggest a protection device comprising a plastic coil form, and an electrically conductive bifilar winding applied to the coil form in one single winding layer, the bifilar winding including a low inductance ohmic resistance operable to restrict an input current, and being made from copper wire.

Accordingly, independent Claim 10 is allowable. Dependent Claims 12 and 15-18 depend from independent Claim 10 and are allowable for the same and other reasons.

The Examiner rejected Claims 3 and 12 under 35 U.S.C. § 103 as being unpatentable over Ho in view of Kalsi and Lace, and further in view of U.S. Patent No. 3,845,417 ("Zaleski").

Claim 3 depends from independent Claim 1, and is allowable for at least the reasons Claim 1 is allowable. Claim 3 further specifies that a plurality of turns of the winding are spaced apart for a mutual insulation.

The Examiner did not recite the use of Kropielnicki in the rejection of Claims 3 and 12, but used Kropielnicki to reject the independent claims of which Claims 3 and 12 depend upon. Also, the Examiner indicated that Ho and Kalsi do not disclose a winding wherein a plurality of turns are spaced apart for mutual isolation, however, the Examiner has not commented on Lace or Kropielnicki. Applicants believe that the Examiner meant to include Kropielnicki in this section 103 rejection and to include Kropielnicki and Lace along with Ho and Kalsi as not disclosing a winding wherein a plurality of turns are spaced apart for mutual isolation.

Zaleski does not cure the deficiencies of Ho, Kalsi, Lace, and Kropielnicki. Zaleski does not teach or suggest a protection device comprising an electrically conductive winding having a low inductance ohmic resistance for restricting input current and an interruption function, and a plastic coil form onto which the winding is applied, wherein the electrically conductive winding is a bifilar winding which is made from copper wire wound in a single layer around said coil form, the wire having a circular cross-section. Rather, Zaleski discloses a body 11 of ferrite around which is a closely wound single layer coil of insulated wire. The ends 13, 14 of the coil are left unconnected. This device is used for modulating microwave energy based on the

magnetic field produced by the device. Zaleski does not teach or suggest a winding for limiting input currents, a plastic coil form, and a bifilar winding made from copper wire.

In addition, there is no suggestion or motivation to combine the teachings of Ho, Kalsi, Lace, Kropielnicki, and Zaleski. Zaleski is simply non-analogous art. A person of ordinary skill in the art would not look to devices that affect microwave energy when designing components or solving problems with input current. Accordingly, dependent Claim 3 is allowable.

Claim 12 depends from independent Claim 10. Ho, Kalsi, Lace, Kropielnicki, and Zaleski do not teach or suggest the subject matter of Claim 12 for at least the reasons set forth above with respect to Claims 3 and 10. Accordingly, Claim 12 is allowable.

The Examiner rejected Claims 6-7 and 15-16 under 35 U.S.C. § 103 as being unpatentable over Ho in view of Kalsi and Lace, and further in view of U.S. Patent No. 4,821,152 (“Lorenzen”).

Claims 6-7 depend from independent Claim 1, and are allowable for at least the reasons Claim 1 is allowable. Claim 6 specifies that the protection device further comprises one of a wire end and a terminal pin to be soldered into a printed circuit board. Claim 7 specifies that the protection device further comprises a soldering point for an assembly on the surface of a printed circuit board.

The Examiner did not recite the use of Kropielnicki in the rejection of Claims 6-7 and 15-16, but used Kropielnicki to reject the independent claims of which Claims 6-7 and 15-16 depend upon. Also, the Examiner indicated that Ho and Kalsi do not disclose the use of wire ends or terminal pins to be soldered into a printed circuit board, however, the Examiner has not commented on Lace or Kropielnicki. Applicants believe that the Examiner meant to include Kropielnicki in this section 103 rejection and to include Kropielnicki and Lace along with Ho and Kalsi as not disclosing the use of wire ends or terminal pins to be soldered into a printed circuit board.

Lorenzen does not cure the deficiencies of Ho, Kalsi, Lace, and Kropielnicki. Lorenzen does not teach or suggest a protection device comprising an electrically conductive winding having a low inductance ohmic resistance for restricting input current and an interruption function, and a plastic coil form onto which the winding is applied, wherein the electrically conductive winding is a bifilar winding which is made from copper wire wound in a single layer

around said coil form, the wire having a circular cross-section. Rather, Lorenzen discloses a method of mounting electric components on printed circuit boards. Lorenzen does not teach or suggest a winding for limiting input currents, a plastic coil form, and a bifilar winding made from copper wire.

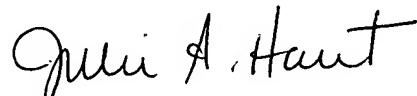
In addition, there is no suggestion or motivation to combine the teachings of Ho, Kalsi, Lace, Kropielnicki, and Lorenzen. The method of Lorenzen cannot be used with Kalsi because the device of Kalsi is not mounted on a circuit board. The superconducting fault current limiter 10 is used in sub-networks of a power plant. The superconducting fault current limiter 10 is not a small electric component suitable for soldering on a circuit board. Accordingly, dependent Claims 6-7 are allowable.

Claims 15-16 depend from independent Claim 10. Ho, Kalsi, Lace, Kropielnicki, and Lorenzen do not teach or suggest the subject matter of Claims 15-16 for at least the reasons set forth above with respect to Claims 6-7 and 10. Accordingly, Claims 15-16 are allowable.

CONCLUSION

In view of the foregoing allowance of Claims 1, 3, 6-10, 12, and 15-18 is respectfully requested. The undersigned is available for telephone consultation during normal business hours.

Respectfully submitted,



Julie A. Haut
Reg. No. 51,789

Docket No. 041165-9052-00
Michael Best & Friedrich LLP
100 East Wisconsin Avenue
Suite 3300
Milwaukee, Wisconsin 53202-4108
414.271.6560